ANPRDI 28 (1–12) 1–432 (1991)
ISSN 0144–557X

# Analytical Proceedings

**Proceedings of the Analytical Division of The Royal Society of Chemistry**

**Volume 28 1991**

Published by
THE ROYAL SOCIETY OF CHEMISTRY
THOMAS GRAHAM HOUSE, SCIENCE PARK,
MILTON ROAD, CAMBRIDGE CB4 4WF

# Analytical Proceedings

**Proceedings of the Analytical Division of The Royal Society of Chemistry**

Officers of the Analytical Division of The Royal Society of Chemistry

*President*
J. D. R. Thomas

*Hon. Secretary*
C. A. Watson

*Hon. Assistant Secretary*
R. Sawyer

*Hon. Publicity Secretary*
J. D. Green

*Hon. Treasurer*
T. B. Pierce

*Secretary*
Miss P. E. Hutchinson

*Editor, Analytical Proceedings*
R. A. Young

*Editorial Manager*
J. Egan

*Assistant Editor*
P. A. Delaney

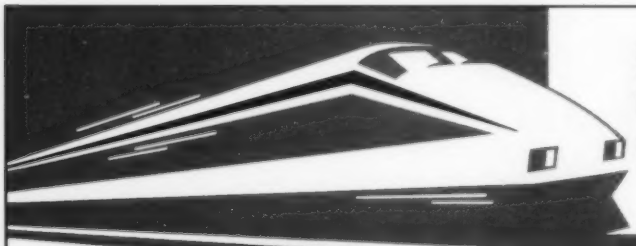
*Editorial Secretary*
C. L. Harris

ANALYTICAL EDITORIAL BOARD

A. G. Fogg (Chairman)
K. D. Bartle
D. Betteridge
*J. Egan
*H. M. Frey
D. E. Games
S. J. Hill
D. L. Miles
J. N. Miller
R. M. Miller
B. L. Sharp

**Ex officio* members

© The Royal Society of Chemistry 1991. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form, or by any means, electronic, mechanical, photographic, recording, or otherwise, without the prior permission of the publishers.



**STN Express®: the fast track to searching scientific databases**

STN® INTERNATIONAL
The Scientific & Technical Information Network

**Easy connection to STN®**

Step aboard STN Express® (for the IBM® AT and PS/2 and Apple® Macintosh), the software that will quickly log you on to STN International® and help you prepare your questions *offline*, before online charges are incurred. Then you can upload and execute your search and produce *print-quality output of both text and graphics*.

**Easy structure searching**

You can draw structures freehand or with templates or venture into molecular modeling. Once you've defined the structure the way you pictured it, *search for it among the 10 million structure diagrams in the CAS Registry file*. Was there a match? If so, that's a valuable piece of information. No match? Knowing that could be *invaluable*.

**Let STN Express introduce you to online searching and STN International. They'll take you searching where you've never been before.**

**YES! Please send me the FREE STN Express evaluation package.**

Name _____

Position _____

Address _____

_____

Phone _____

Enquirers from Eire or UK, please return to: STN International, c/o Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge CB4 4WF, United Kingdom
STN Help Desk (0223) 420237

# NAME INDEX


A

**Abollino, O., Mentasti, E., Sarzanini, C., Porta, V.,** and **van den Berg, C. M. G.** Speciation of iron in Antarctic lake water by adsorptive cathodic stripping voltammetry, 72.
**Adams, M. J.** Cluster analysis with infrared spectra, 147.
**Alder, J. F.** Competitive adsorption on to coated surface acoustic wave sensors, 325.
**Alimarin, I. P.** (the late). 5th Robert Boyle Medal presented to his widow, 209.
**Analytical Methods Committee.** Evaluation of analytical instrumentation. Part VII. Simultaneous wavelength dispersive X-ray spectrometers, 312.
**Anderson, R. G.,** and **Fox, N. V.** Separation of urinary organic acids by high-performance liquid chromatography, 43.
**Andrews, A. R. J.** Applications of chemiluminescence to clinical, forensic and pharmaceutical analysis, 38.
**Andrews, D. L.** Introduction to laser excitation spectroscopy, 408.
**Ansell, R. O., McAleer, H., McNaughtan, A.,** and **Pugh, J. R.** Voltammetric investigation of natural waters using microelectrodes, 63.
**Archer, G. T.** Third report from sponsored VSO teacher, 310.
**Ashcroft, A. E.** Use of mass spectrometry in pharmaceutical analysis, 179.
**Ashfold, M. N. R.** Multiphoton absorption spectroscopy, 416.
**Attard, G. A.** Fuel cell sensor design for carbon monoxide and methanol using platinum single crystals, 331.

B

**Bahari, M. S., Criddle, W. J.,** and **Thomas, J. D. R.** Spectrophotometric end-point for the phase-titration determination of the adulteration of petrol with kerosine, 14.
**Bale, A. J.** Sampling considerations in the North Sea, 264.
**Barker, P. G.** Some artificial inteligence techniques for the interpretation of experimental data, 110.
**Barnett, N. W.** *See* **Handley, H. W.**
**Bartlett, P. N.** Applications of electropolymerized films in electrochemical sensors, 373.
——, **Dodd, G. H., Gardner, J. W.,** and **Shurmer, H. V.** Warwick electronic nose, 343.
**Baxter, M. S.** *See* **Scott, R. D.**
**Berry, M. J.** Immunoaffinity purification of industrially relevant enzymes, 141.
**Bianchi, A.** *See* **Varney, M.**
**Bingham, B., Boyle, R., Ferris, M. M.,** and **Leonard, M. A.** Ternary complex formation between Alizarin Fluorine Blue, lanthanoid ions and ethylenediaminetetraacetic acid type chelating ligands, 197.
**Blackledge, C. A.** *See* **Wilson, I. D.**
**Blum, L. J.** *See* **Coulet, P. R.**
**Boden, G. F.** Headspace analysis by gas chromatography–mass spectrometry of polymers and polymer additives, 344.
**Boley, N. P.** *See* **Shanahan, G. J.**
**Boother, J.** Computer-assisted learning of analytical chemistry, 189.
**Boussemart, M.,** and **van den Berg, C. M. G.** Determination of chromium speciation in sea-water, 68.
**Boyle, R.** *See* **Bingham, B.**
**Braun, T.,** and **Zsindely, S.** Some recent trends in instrumental analysis of environmental materials. (Analytical Viewpoint), 283.
**Breen, W.** *See* **Lyons, M. E. G.**
**Brennan, J. D.** *See* **Krull, U. J.**
**Brereton, R. G.** Chemometrics as an aid to liquid chromatography optimization, 145.
**Brett, L., Kalsi, A., Cummins, S.,** and **Thombs, D.** Approach to the computer aided interpretation of spectra produced on a diode array system, 224.
**Brown, R. S.** *See* **Krull, U.J.**
**Buffle, J.** *See* **De Vitre, R. R.**

C

**Cade, N. J., Gibbs, K., Iredale, P. J.,** and **Williams, D. A.** Recent advances in applied electrochemical gas sensors, 379.
**Cadogan, A., Diamond, D., Cremin, S., McKervey, A. M.,** and **Harris, S. J.** Potassium-selective electrode based on a dioxacalixarene: an example of a new series of ionophores, 13.
**Canesi, L.** *See* **Mazzucotelli, A.**
**Capodaglio, G., Scarponi, G.,** and **Cescon, P.** Lead speciation in the Antarctic Ocean, 76.
**Carroll, J.** Awarded Hilger spectroscopy prize for 1990, 25.
**Cassidy, J. F.** *See* **Lyons, M. E. G.**
**Cescon, P.** *See* **Capodaglio, G.**
**Chadwick, N.** Continuing professional development for analytical chemists, 191.
**Chatham, S. M.** *See* **Hawley, A. R.**
**Chaudhry, M. M., Ure, A. M., Cooksey, B. G., Littlejohn, D.,** and **Halls, D.** Investigation of *in situ* concentration of hydride forming elements in a graphite furnace atomiser, 44.
**Chen, W.** *See* **Morrison, G. M.**
**Chimpalee, N.** *See* **Harriott, M.**
**Cluley, H. J.** Obituary, 26, 57.
**Cocks, S.,** and **Smith, R. M.** Analysis of fatty acid methyl esters by using supercritical fluid chromatography with mass evaporative light scattering detection, 11.
**Cofino, W. P.** Analytical requirements in view of North Sea environmental policy, 260.
**Coles, G. S. V.** Semiconductor gas sensors and selectivity, 367.
**Coles, L. E.** Obituary, 303.
**Cooksey, B. G.** *See* **Chaudhry, M. M.**
**Coulet, P. R.,** and **Blum, L. J.** Bioluminescent sensors, 358.
**Cremin, S.** *See* **Cadogan, A.**
**Cresser, M. S.** *See* **Jerrow, M.**
**Criddle, W. J.** *See* **Bahari, M. S.**
—— and **Jones, T. P.** Use of platinum-based fuel cells for ethanol analysis, 338.
**Crosby, N. T.** *Ad hoc* analysis: how do you know you have got it right? (Analytical Viewpoint), 138.
**Cummins, S.** *See* **Brett, L.**
**Cunningham, K., Svehla, G., Harris, S. J.,** and **McKervey, M. A.** Sodium-selective poly(vinyl chloride) membrane ion-selective electrode based on a novel calix[4]arene ionophore, 294.

D

**Davison, W.** Voltammetric determination of inorganic sulphur species in natural waters, 59.
**Deacon, M.** *See* **O'Dea, P.**
**del Castilho, P.** Determination and speciation of heavy metals in sea-water: an overview of methods available and results achievable, 253.
**De Paz, F.** *See* **Mazzucotelli, A.**
**De Vitre, R. R., Tercier, M.-L.,** and **Buffle, J.** *In situ* voltammetric measurements in natural waters: the advantages of microelectrodes, 74.
**Diamond, D.** *See* **Cadogan, A.**

—— *See* **Forster, R. J.**
**Dodd, G. H.** *See* **Bartlett, P. N.**
**Dowle, C. J.** *See* **Robertson, A. M.**
**Dunn, M. J.** Recent developments in gel electrophoresis of proteins, 123.

E

**Ebdon, L.** *See* **Handley, H. W.**
**Edmunds, H.** *See* **Hydes, D.**
**Elmosalamy, M. A. F., Harris, N. K., Moody, G. J.,** and **Thomas, J. D. R.** Evaluation of sensors coated on piezoelectric quartz crystals for the determination of aromatic compounds, 326.
**Euerby, M. R., Lewis, R. J.,** and **Nichols, S. C.** Preliminary investigations into the use of supercritical fluid extraction to extract a novel corticosteroid (tipredane INN) from rodent diet, 287.
**Everett, J. R.** High-resolution nuclear magnetic resonance spectroscopy of biofluids and applications in drug metabolism, 181.

F

**Ferris, M. M.** *See* **Bingham, B.**
**Fifield, F. W.** The aims of teaching analytical science in higher education, 189.
**Finniear, M. C.** New member of Council, 397.
**Flockhart, B. D.** *See* **Tsang, E. P. K.**
**Fogg, A. G.** Royal Society of Chemistry Awards 1989—Electroanalytical Chemistry, 309.
—— *See* **Moreira, J. C.**
**Forster, R. J.,** and **Diamond, D.** Multivariate calibration of potentiometric sensor arrays, 117.
**Fox, N. V.** *See* **Anderson, R. G.**

G

**Games, D. E.** New member of Council, 397.
**Gardner, J. W.** *See* **Bartlett, P. N.**
**Gardner, M.** *See* **Ravenscroft, J.**
**Garip, M. U.,** and **Thompson, M.** Surface-active chelating agents in analytical chemistry, 2.
**Gerringa, L. J. A.** Problems of the estimation of the complexation characteristics of dissolved organonickel complexes, 73.
**Ghaemmaghami, V.** *See* **Krull, U. J.**
**Ghauri, F. Y. K.** *See* **Wilson, I. D.**
**Gibbs, K.** *See* **Cade, N. J.**
**Gill, P.** *See* **Sullivan, K. M.**
**Gorsuch, T.** Elected as President of IFST, 204.
**Green, M. J.,** and **Hilditch, P. I.** Disposable single-use sensors, 374.
**Guevremont, R., Quigley, M. N.,** and **Schweitzer, M.** Strategies in the design of an effective fibre optic sensor for the detection of paralytic shellfish poisons. (Analytical Viewpoint), 241.

H

**Haapakka, K., Kankare, J.,** and **Kulmala, S.** Time-resolved lanthanide(III) electroluminescence and its analytical feasibilty, 360.
**Hagelberg, E.** Molecular archaeology, 152.
**Hahn, C. E. W.** Developments in membrane-covered gas sensors for oxygen and other gases in relation to the clinical and biomedical field, 336.
**Hall, L. D.** Royal Society of Chemistry Awards 1990—Chemical Analysis and Instrumentation, 281.
**Halls, D. J.** *See* **Chaudhry, M. M.**
**Handley, H. W., Jones, P., Ebdon, L.,** and **Barnett, N. W.** Development of an automated high-performance liquid chromatography system for the determination of trace metals in concentrated brines, 37.
**Harriott, M., Thorburn Burns, D.,** and **Chimpalee, N.** Applications of a slotted tube atom trap and flame atomic absorption spectrometry: determination of antimony in copper-based alloys after hydride generation, 193.
**Harris, N. K.** *See* **Elmosalamy, M. A. F.**
**Harris, S. J.** *See* **Cadogan, A.**
—— *See* **Cunningham, K.**
**Harrop, R. A.,** and **Quigley, M. N.** Factors affecting the fluorimetric determination of polystyrene sulfonate in aqueous solution. (Analytical Viewpoint), 398.
**Hart, J. P.,** and **Wring, S. A.** Carbon-based electrodes and their application as electrochemical sensors for selected biomolecules, 4.
**Haswell, S. J.,** and **Walmsley, A. D.** Chemometrics—the key to sensor array development, 115.
**Hawley, A. R., Rowley, G., Lough, W. J.,** and **Chatham, S. M.** Chromatographic analysis of novel pharmaceutical excipients for liquid filled capsules, 289.
**Hilditch, P. I.** *See* **Green, M. J.**
**Hollas, J. M.** Laser electronic spectroscopy of large molecules, 411.
**Honeybourne, C. L.,** and **O'Donnell, J.** Gas monitoring based on phthalocyanines and related materials, 333.
**Hopgood, R.** *See* **Sullivan, K. M.**
**Huang, H. P.** *See* **Morgan, E. D.**
**Hulanicki, A.** Appointed Theophilus Redwood Lecturer for 1992, 101.
**Hursthouse, A. S.** *See* **Scott, R. D.**
**Hutt, A. J.** Enantiospecific bioanalysis, 185.
**Hyde, M. G.,** and **Beddard, G. S.** Picosecond photodissociation and geminate radical recombination of tetraphenylhydrazine, 418.
**Hydes, D.,** and **Edmunds, H.** Interpretation of inorganic nutrient distributions in the North Sea, 254.

I

**Iredale, P. J.** *See* **Cade, N. J.**

J

**Jaggers, H. C., Shaw, J. S.,** and **Peacock, S. J.** Vapour sensing by the technique of surface plasmon resonance, 341.
**Janata, J.,** and **Langmaier, J.** Gas sensors using the work function of organic semiconductors, 372.
**Jerrow, M., Marr, I. L.,** and **Cresser, M. S.** Magnesium as modifier for the determination of barium by flame atomic emission spectrometry, 40.
**Jian, W.,** and **McLeod, C. W.** Field sampling technique for mercury speciation, 293.
**Johnston, P. A.,** and **Stringer, R. L.** Analytical difficulties in the full characterization of industrial effluents, 249.
**Jones, K.** Affinity chromatography—an overview, 140.
**Jones, P.** *See* **Handley, H. W.**
**Jones, T. P.** *See* **Criddle, W. J.**

K

**Kallury, K. M.** *See* **Krull, U. J.**
**Kalsi, A.** *See* **Brett, L.**
**Kankare, J.** *See* **Haapakka, K.**

**Kell, D. B.**, and **Woodward, A. M.** Non-faradaic electrochemical sensors: principles and practice, 378.
**Kellner, R.** *See* **Niinisto, L.**
**Kibble, H. A. B.** *See* **Offley, S. G.**
**King, B.**, and **Phillips, G F.** Validity of analytical measurements, 125.
**Kleitz, M.** Novel solid-state potentiometric sensors, 369.
**Krull, U. J., Nikolelis, D. P., Brennan, J. D., Brown, R. S., Thompson, M., Ghaemmaghami, V.**, and **Kallury, K. M.** Control of ion transport through lipid membranes, 370.
**Kulmala, S.** *See* **Haapakka, K.**

L

**Langmaier, J.** *See* **Janata, J.**
**Large, R.** Problems associated with the analysis of hydrocarbons in marine sediments, 263.
**Law, R. J.**, and **Thain, J. E.** Environmental monitoring and analysis in the North Sea under the North Sea Task Force, 250.
**Ledingham, K. W. D.** Laser mass spectroscopy, 413.
**Leonard, M. A.** *See* **Bingham, B.**
**Leonard, R. G.** *See* **O'Dea, P.**
**Lewenstam, A.** Ion-selective electrodes in clinical chemistry: state of the art, 106.
**Lewis, R. J.** *See* **Euerby, M. R.**
**Lingard, D.** *See* **Sullivan, K. M.**
**Littlejohn, D.** *See* **Robertson, A. M.**
—— *See* **Chaudhry, M. M.**
**Livingstone, D. J.** Applications of cluster analysis in molecular modelling and drug design, 247.
**Lockhart, J. C.** Design and synthesis of receptors for sensor use, 369.
**Lough, W. J.** *See* **Hawley, A. R.**
**Lyons, C. H.** *See* **Lyons, M. E. G.**
**Lyons, M. E. G., Lyons, C. H., McCormack, D. E., McCabe, T. J., Breen, W.**, and **Cassidy, J. F.** Conducting polymer-based amperometric chemical sensors, 104.

M

**Malcolm, A. D. B.** Strategies of the polymerase chain reaction, 154.
**Manley, C. H.** Obituary, 132.
**Marr, I. L.** *See* **Jerrow, M.**
**Marshall, J.** Awarded 19th SAC Silver Medal, 271.
**Mazzucotelli, A., Viarengo, A., Canesi, L., De Paz, F., Ponzano, E.**, and **Rivaro, P.** Investigation of organometallics in the marine ecosystem by high-performance liquid chromatography with inductively coupled plasma atomic emission spectrometric and electrochemical detection, 79.
**McAleer, H.** *See* **Ansell, R. O.**
**McCabe, T. J.** *See* **Lyons, M. E. G.**
**McCormack, D. E.** *See* **Lyons, M. E. G.**
**McCoustra, M. R. S.** Current aspects of laser instrumentation, 409.
**McKay, K.** *See* **Scott, R. D.**
**McKervey, A. M.** *See* **Cadogan, A.**
**McKervey, M. A.** *See* **Cunningham, K.**
**McLachlan, T.** Obituary, 429.
**McLeod, C. W.** *See* **Jian, W.**
**McNaughtan, A.** *See* **Ansell, R. O.**
**Meaney, M.** *See* **Ryan, E.**
**Mentasti, E.** *See* **Abollino, O.**
**Miller, R. D.** *See* **Moreira, J. C.**
**Mills, I. M.** Royal Society of Chemistry Awards 1990–Spectroscopy, 281.
**Mitrofanova, Z. V.** Receives 5th Robert Boyle Medal on behalf of her late husband, I. P. Alimarin, 209.
**Moody, G. J.** *See* **Elmosalamy, M. A. F.**
**Moreira, J. C., Miller, R. D.**, and **Fogg, A. G.** Determination of trace amounts of bacitracin by differential-pulse adsorptive stripping voltammetry at a hanging mercury drop electrode, 16.
**Morgan, E. D., Huang, H. P.**, and **Wilson, I. D.** Supercritical fluid chromatography of polar compounds, 186.
**Morrison, G. M.**, and **Chen, W.** Electroanalysis of metal speciation and its relevance to ecotoxicology, 70.

N

**Nelson, A.** Electrochemical modelling of ion channel transport: thallium voltammetry at phospholipid monolayer coated mercury electrodes modified with gramicidin, 64.
**Newman, E. J.** 1991 Review of Analytical Division Subject Groups, 169.
**Nicholas, P.** Gas analysis using mass spectrometry, 343.
**Nichols, S. C.** *See* **Euerby, M. R.**
**Nicholson, J. K.** Awarded 20th SAC Silver Medal, 271.
—— *See* **Wilson, I. D.**
—— and **Wilson, I. D.** Strategic applications of proton nuclear magnetic resonance spectroscopy in clinical biochemistry and analytical toxicology, 183.
**Niinisto, L.**, and **Kellner, R.** European Analytical Column 15: Working Party on Analytical Chemistry (WPAC/FECS), 100.
**Nikolelis, D. P.** *See* **Krull, U. J.**

O

**O'Dea, P., Deacon, M., Smyth, M. R.**, and **Leonard, R. G.** Investigation into a cation exchange separation method for the determination of transition metal ions in anaerobic sealants, 82.
**O'Donnell, J.** *See* **Honeybourne, C. L.**
**Offley, S. G., Seare, N. J., Tyson, J. F.**, and **Kibble, H. A. B.** Determination of selenium in copper metal using flow injection hydride generation atomic absorption spectrometry with continuous flow matrix isolation, 18.

P

**Peacock, S. J.** *See* **Jaggers, H. C.**
**Persaud, K. C.** Odour detection using sensor arrays, 339 (Erratum, 422).
**Pfab, J.** Laser-induced fluorescence, 415.
**Phillips, G. F.** *See* **King, B.**
—— Continuing postgraduate education in analytical chemistry, 281.
—— Pharmaceutical analysis—past, present and future, 420.
**Ponzano, E.** *See* **Mazzucotelli, A.**
**Porta, V.** *See* **Abollino, O.**
**Pugh, J. R.** *See* **Ansell, R. O.**

Q

**Quigley, M. N.**, and **Vernon, F.** Comparison of coprecipitation and chelating ion exchange for the preconcentration of selected heavy metals from sea-water. (Analytical Viewpoint), 175.
—— *See* **Guevremont, R.**
—— *See* **Harrop, R. A.**

R

**Ravenscroft, J.**, and **Gardner, M.** Performance of metal–ligand titration techniques, 61.

**Reid, P. C.**, and **Roberts, M. J.** Co-ordination of North Sea research and the North Sea database, 258.
**Rivaro, P.** *See* **Mazzucotelli, A.**
**Roberts, M. J.** *See* **Reid, P. C.**
**Robertson, A. M., Wylie, L., Littlejohn, D., Watling, R. J.**, and **Dowle, C. J.** Thermospray interface for high-performance liquid chromatography–diffuse reflectance Fourier transform infrared analysis, 8.
**Rowley, G.** *See* **Hawley, A. R.**
**Ryan, E.**, and **Meaney, M.** High-performance liquid chromatographic determination of some trace metal ions using a novel column switching technique, 41.

S

**Sampson, K.** *See* **Scott, R. D.**
**Santos, M. M. C.**, and **Simões Gonçalves, M. L.** Reduction of copper(II) in the presence of monoamines at the ionic strength of sea-water, 77.
**Sarzanini, C.** *See* **Abollino, O.**
**Sawyer, R.** Receives 21st Analytical Division Distinguished Service Award, 97, 98.
**Scarponi, G.** *See* **Capodaglio, G.**
**Scawen, M. D.** Dye affinity chromatography, 143.
**Schweitzer, M.** *See* **Guevremont, R.**
**Scott, C. J. P.** Two applications of principal components analysis of an industrial process and quantitative analysis of water in a substrate, 245.
**Scott, R. D., Baxter, M. S., Hursthouse, A. S., McKay, K., Sampson, K.**, and **Toole, J.** Detection of actinides in environmental samples by inductively coupled plasma mass spectrometry, 382.
**Seare, N. J.** *See* **Offley, S. G.**
**Sepaniak, M. J.** Laser fluorimetric detection in capillary electrophoresis, 359.
**Shanahan, G. J., Boley, N. P.**, and **Traynor, A. D.** Total luminescence spectroscopy in the identification of coumarin (1,2-benzopyrone) in road fuels. (Analytical Viewpoint), 210.
**Shaw, J. S.** *See* **Jaggers, H. C.**
**Shurmer, H. V.** *See* **Bartlett, P. N.**
**Simões Gonçalves, M. L.** *See* **Santos, M. M. C.**
**Slater, J. M.**, and **Watt, E. J.** Examination of ammonia–polypyrrole interactions by piezoelectric and conductivity measurements, 344.
**Smith, G. L.** Principal component analysis: an introduction, 150.
**Smith, I. D.** Evaluation of the Foss–Heraeus Macro N for the determination of nitrogen in a wide range of foodstuffs, ingredients and biological materials and comparison the the Kjelfoss. (Analytical Viewpoint), 320.
**Smith, R. M.** Analytical short courses for industrial needs, 190.
—— Royal Society of Chemistry Awards 1990—Analytical Separation Methods, 281.
—— *See* **Cocks, S.**
**Smyth, M. R.** *See* **O'Dea, P.**
**Smyth, W. F.** Analytical chemistry of complex matrices. (Analytical Viewpoint), 34.
**Stringer, R. L.** *See* **Johnston, P. A.**
**Sullivan, K. M., Tully, G., Hopgood, R., Lingard, D.**, and **Gill, P.** Strategies for the use of the polymerase chain reaction in forensic analysis, 153.
**Svehla, G.** *See* **Cunningham, K.**
**Sweeting, F. W.** Receives 22nd Analytical Division Distinguished Service Award, 97, 98.

T

**Tercier, M.-L.** *See* **De Vitre, R. R.**
**Thain, J. E.** *See* **Law, R. J.**
**Thomas, A. H.** Awarded 23rd Analytical Division Distinguished Service Award, 271.
**Thomas, J. D. R.** Appointed to a Personal Chair in the School of Chemistry and Applied Chemistry, University of Wales College of Cardiff, 50.
—— Presentation of the 5th Robert Boyle Medal in Analytical Chemistry, 209.
—— *See* **Bahari, M. S.**
—— *See* **Elmosalamy, M. A. F.**
**Thombs, D.** *See* **Brett, L.**
**Thompson, M.** *See* **Garip, M. U.**
—— *See* **Krull, U. J.**
**Thorburn Burns, D.** Receives 3rd AnalaR Gold Medal, 174.
—— Robert Boyle (1627–1691): a foundation stone of analytical chemistry in the British Isles. Part VI. Contributions to the early study of luminescence, 362.
—— *See* **Harriott, M.**
—— *See* **Tsang, E. P. K.**
—— The Lunar Society and Midlands chemists, 402.
**Toole, J.** *See* **Scott, R. D.**
**Townshend, A.** Receives 19th SAC Gold Medal, 97, 101.
**Traynor, A. D.** *See* **Shanahan, G. J.**
**Tsang, E. P. K., Thorburn Burns, D.**, and **Flockhart, B. D.** Determination of nitrate and nitrite ions by electron paramagnetic resonance spectrometry, 10.
**Tully, G.** *See* **Sullivan, K. M.**
**Turner, A. P. F.** Applications of amperometric biosensors, 376.
**Tyson, J. F.** *See* **Offley, S. G.**

U

**Ure, A. M.** *See* **Chaudhry, M. M.**

V

**van den Berg, C. M. G.** Reality of metal speciation measurements in natural waters, 58.
—— *See* **Abollino, O.**
—— *See* **Boussemart, M.**
**van Leeuwen, H. P.** Stripping voltammetry of metal complexes with macromolecular ligands: some fundamental aspects, 66.
**Varney, M.**, and **Bianchi, A.** Purge and trap of volatile organics in the marine environment using gas chromatography–mass spectrometry, 256.
**Vernon, F.** *See* **Quigley, M. N.**
**Viarengo, A.** *See* **Mazzucotelli, A.**
**Vose, C. W.** Implications of regulatory requirements for bioanalytical techniques and resources, 177.

W

**Walmsley, A. D.** *See* **Haswell, S. J.**
**Wang, J.** Chemically and biologically tailored interfaces as amperometric sensors, 102.
**Watling, R. J.** *See* **Robertson, A. M.**
**Watt, E. J.** *See* **Slater, J. M.**
**Watts, P.** Use of ion mobility spectroscopy for the detection and analysis of vapours, 328.
**Whelpton, R.** Liquid–liquid and liquid–solid phase extraction as applied to the determination of drugs in biological samples, 178.
**Williams, D. A.** *See* **Cade, N. J.**
**Williams, D. E.** Solid-state gas sensors: prospects for selectivity, 366.
**Williams, W. J.** Education and Training Committee-aims and activities, 391.

**Willis, H. A.** Obituary, 26.
**Wilson, I. D., Nicholson, J. K., Ghauri, F. Y. K.,** and **Blackledge, C. A.** Use of high-field nuclear magnetic resonance spectroscopy for the analysis of biological fluids, 217.
—— Receives 17th SAC Silver Medal, 217.
—— *See* **Morgan, E. D.**
—— *See* **Nicholson, J. K.**
**Wolfbeis, O. S.** From fluorescent probes to optical sensors, 357.
**Wollast, R.** *See* **Zhang, H.**
**Woodget, B.** 1991 Schools Analyst Competition, 174.
**Woodward, A. M.** *See* **Kell, D. B.**
**Worsfold, P. J.** Flow injection—from fireflies to field monitors, 214.
—— Receives 18th SAC Silver Medal, 214.
**Worswick, R.** New Government Chemist, 137.
**Wring, S. A.** *See* **Hart, J. P.**
**Wylie, L.** *See* **Robertson, A. M.**

## Z

**Zhang, H.,** and **Wollast, R.** Speciation of cobalt and nickel in the North Sea, 80.
**Zsindely, S.** *See* **Braun, T.**

# SUBJECT INDEX


A

**AAS:** *See* **Spectrometry, atomic absorption.**

**Acids, fatty:** Analysis of fatty acid methyl esters by using supercritical fluid chromatography with mass evaporative light scattering detection. Cocks and Smith, 11.

**Acids, organic:** Separation of urinary organic acids by high-performance liquid chromatography. Anderson and Fox, 43.

**Actinides:** Detection of actinides in environmental samples by inductively coupled plasma mass spectrometry. Scott, Baxter, Hursthouse, McKay, Sampson and Toole, 382.

**Adsorptive stripping voltammetry:** *See* **Voltammetry.**

**Adulteration:** Spectrophotometric end-point for the phase-titration determination of the adulteration of petrol with kerosine. Bahari, Criddle and Thomas, 14.

**Affinity chromatography:** *See* **Chromatography, affinity.**

**Agents, surface active:** Surface-active chelating agents in analytical chemistry. Garip and Thompson, 2.

**Alizarin Fluorine Blue:** Ternary complex formation between Alizarin Fluorine Blue, lanthanoid ions and ethylenediaminetetraacetic acid type chelating ligands. Bingham, Boyle, Ferris and Leonard, 197.

**Ammonia:** Examination of ammonia–polypyrrole interactions by piezoelectric and conductivity measurements. Slater and Watt, 344.

**AnalaR Gold Medal, 1990:** Presented to D. Thorburn Burns, 174.

**Analytical chemistry:** *Ad hoc* analysis: how do you know you have got it right? (Analytical Viewpoint.) Crosby, 138.
Analytical chemistry of complex matrices. (Analytical Viewpoint.) Smyth, 34.
Analytical short courses for industrial needs. Smith, 190.
Computer-assisted learning of analytical chemistry. Boother, 189.
Continuing postgraduate education in analytical chemistry. Phillips, 281.
Continuing professional development for analytical chemists. Chadwick, 191.
Robert Boyle (1627–1691): a foundation stone of analytical chemistry in the British Isles. Part VI. Contributions to the early study of luminescence. Thorburn Burns, 362.
Some recent trends in instrumental analysis of environmental materials. (Analytical Viewpoint.) Braun and Zsindely, 283.
Surface-active chelating agents in analytical chemistry. Garip and Thompson, 2.
The aims of teaching analytical science in higher education. Fifield, 189.
Third report from sponsored VSO teacher. Archer, 310.
Validity of analytical measurements. King and Phillips, 125.
Working Party on Analytical Chemistry (WPAC/FECS). (European Analytical Column 14), 1.
Working Party on Analytical Chemistry (WPAC/FECS). (European Analytical Column 15). Niinsto and Kellner, 100.

**Analytical Division:** 19th AGM, 97.
Analytical Division subject groups. Newman, 169.
Atomic Spectroscopy Group. 26th AGM, 33.
Biological Methods Group. 46th AGM, 33.
Chemometrics Group. 4th AGM, 169.
Chromatography and Electrophoresis Group. 26th AGM, 33.
Distinguished Service Award, 23rd. Conferred on A. H. Thomas, 271.
Distinguished Service Award—R. Sawyer, 98.
Distinguished Service Award—F. W. Sweeting, 98.
Education and Training Committee—aims and activities. Williams, 391.
Electroanalytical Group. 21st AGM, 57.
Electroanalytical Group—Review, 169.
Gold Medal, 19th. Awarded to A. Townshend, 101.
Micro and Chemical Methods Group. 47th AGM, 33.
Midlands Region. 36th AGM, 57.
Molecular Spectroscopy Group. 4th AGM, 33.
North East Region. 25th AGM, 169.
North West Region. 66th AGM, 137.
Particle Characterization Group—Review, 172.
Radiochemical Methods Group. 24th AGM, 33.
Radiochemical Methods Group—Review, 172.
Robert Boyle Medal, 5th. Presented to widow of I. P. Alimarin, 209.
Schools Lecturer 1992/93. R. D. Snook, 271.
Scottish Region. 56th AGM, 33.
Silver Medal, 19th. Awarded to J. Marshall, 271.
Silver Medal, 20th. Awarded to J. K. Nicholson, 271.
Theophilus Redwood Lecturer. A. Hulanicki, 101.

**Analytical toxicology:** Strategic applications of proton nuclear magnetic resonance spectroscopy in clinical biochemistry and analytical toxicology. Nicholson and Wilson, 183.

**Analytical Viewpoints:** 34, 138, 175, 210, 241, 283, 320, 398.

**Antibiotics:** Determination of trace amounts of bacitracin by differential-pulse adsorptive stripping voltammetry at a hanging mercury drop electrode. Moreira, Miller and Fogg, 16.

**Antimony:** Applications of a slotted tube atom trap and flame atomic absorption spectrometry: determination of antimony in copper-based alloys after hydride generation. Harriott, Thorburn Burns and Chimpalee, 193.

**Archaeology:** Molecular archaeology. Hagelberg, 152.

**Association of Official Analytical Chemists:** Change of name of Association, 428.

**Atom trap:** Applications of a slotted tube atom trap and flame atomic absorption spectrometry: determination of antimony in copper-based alloys after hydride generation. Harriott, Thorburn Burns and Chimpalee, 193.

**Atomic absorption spectrometry:** *See* **Spectrometry, atomic absorption.**

**Atomic emission spectrometry:** *See* **Spectrometry, atomic emission.**

**Atomiser, graphite furnace:** Investigation of *in situ* concentration of hydride forming elements in a graphite furnace atomiser. Chaudhry, Ure, Cooksey, Littlejohn and Halls, 44.

**Automation:** Development of an automated high-performance liquid chromatography system for the determination of trace metals in concentrated brines. Handley, Jones, Ebdon and Barnett, 37.

B

**Bacitracin:** Determination of trace amounts of bacitracin by differential-pulse adsorptive stripping voltammetry at a hanging mercury drop electrode. Moreira, Miller and Fogg, 16.

**Barium:** Magnesium as modifier for the determination of barium by flame atomic emission spectrometry. Jerrow, Marr and Cresser, 40.

**Biochemical analysis:** Bioluminescent sensors. Coulet and Blum, 358.

**Biological fluids:** Use of high-field nuclear magnetic resonance spectroscopy for the analysis of biological fluids. Wilson, Nicholson, Ghauri and Blackledge, 217.

**Biological materials:** Evaluation of the Foss–Heraeus Macro N

for the determination of nitrogen in a wide range of foodstuffs, ingredients and biological materials and comparison with the Kjelfoss. (Analytical Viewpoint.) Smith, 320.

**Biological matrices:** Enantiospecific bioanalysis. Hutt, 185.
High-resolution nuclear magnetic resonance spectroscopy of biofluids and applications in drug metabolism. Everett, 181.
Liquid–liquid and liquid–solid phase extraction as applied to the determination of drugs in biological samples. Whelpton, 178.

**Biomedical analysis:** Implications of regulatory requirements for bioanalytical techniques and resources. Vose, 177.

**Biosensors:** *See* **Sensors, biomedical.**

**Biotechnology:** Affinity chromatography—an overview. Jones, 140.
Immunoaffinity purification of industrially relevant enzymes. Berry, 141.

**Brine:** Development of an automated high-performance liquid chromatography system for the determination of trace metals in concentrated brines. Handley, Jones, Ebdon and Barnett, 37.

**British Standards, new:** 26, 273.

C

**Calixarenes:** Potassium-selective electrode based on a dioxacalixarene: an example of a new series of ionophores. Cadogan, Diamond, Cremin, McKervey and Harris, 13.
Sodium-selective poly(vinyl chloride) membrane ion selective electrode based on a novel calix[4]arene ionophore. Cunningham, Svehla, Harris and McKervey, 294.

**Capillary electrophoresis:** *See* **Electrophoresis, capillary.**

**Carbon-based electrode:** Carbon-based electrodes and their application as electrochemical sensors for selected biomolecules. Hart and Wring, 4.

**Carbon monoxide:** Fuel cell sensor design for carbon monoxide and methanol using platinum single crystals. Attard, 331.

**Cation exchange separation:** Investigation of a cation exchange separation method for the determination of transition metal ions in anaerobic sealants. O'Dea, Deacon, Smyth and Leonard, 82.

**Chelating ligands:** *See* **Ligands.**

**Chemiluminescence:** Applications of chemiluminescence to clinical, forensic and pharmaceutical analysis. Andrews, 38.
Flow injection—from fireflies to field monitors. Worsfold, 214.

**Chemometrics:** Applications of cluster analysis in molecular modelling and drug design. Livingstone, 247.
Cluster analysis with infrared spectra. Adams, 147.
Chemometrics as an aid to liquid chromatography optimization. Brereton, 145.
Chemometrics—the key to sensor array development. Haswell and Walmsley, 115.
Lead speciation in the Antarctic Ocean. Capodaglio, Scarponi and Cescon, 76.
Multivariate calibration of potentiometric sensor arrays. Forster and Diamond, 117.
Performance of metal–ligand titration techniques. Ravenscroft and Gardner, 61.
Principal component analysis: an introduction. Smith, 150.
Reality of metal speciation measurements in natural waters. van den Berg, 58.
Speciation of cobalt and nickel in the North Sea. Zhang and Wollast, 80.
Stripping voltammetry of metal complexes with macromolecular ligands: some fundamental aspects. van Leeuwen, 66.
Two applications of principal components analysis of an industrial process and quantitative analysis of water in a substrate. Scott, 245.

**Chromatography:** Nomenclature for chromatography (IUPAC), 390.

**Chromatography, affinity:** Affinity chromatography—an overview. Jones, 140.
Dye affinity chromatography. Scawen, 143.
Immunoaffinity purification of industrially relevant enzymes. Berry, 141.

**Chromatography, column:** Enantiospecific bioanalysis. Hutt, 185.

**Chromatography, gas:** Chromatographic analysis of novel pharmaceutical excipients for liquid filled capsules. Hawley, Rowley, Lough and Chatham, 289.
Headspace analysis by gas chromatography–mass spectrometry of polymers and polymer additives. Boden, 344.
Purge and trap of volatile organics in the marine environment using gas chromatography–mass spectrometry. Varney and Bianchi, 256.

**Chromatography, HPLC:** Chemometrics as an aid to liquid chromatography optimization. Brereton, 145.
Chromatographic analysis of novel pharmaceutical excipients for liquid filled capsules. Hawley, Rowley, Lough and Chatham, 289.
Development of an automated high-performance liquid chromatography system for the determination of trace metals in concentrated brines. Handley, Jones, Ebdon and Barnett, 37.
High-performance liquid chromatographic determination of some trace metal ions using a novel column switching technique. Ryan and Meaney, 41.
Investigation of organometallics in the marine ecosystem by high-performance liquid chromatography with inductively coupled plasma atomic emission spectrometric and electrochemical detection. Mazzucotelli, Viarengo, Canesi, De Paz, Ponzano and Rivaro, 79.
Separation of urinary organic acids by high-performance liquid chromatography. Anderson and Fox, 43.

**Chromatography, supercritical fluid:** Analysis of fatty acid methyl esters by using supercritical fluid chromatography with mass evaporative light scattering detection. Cocks and Smith, 11.
Supercritical fluid chromatography of polar compounds. Morgan, Huang and Wilson, 186.

**Chromium speciation:** Determination of chromium speciation in sea-water. Boussemart and van den Berg, 68.

**Clinical biochemistry:** Strategic applications of proton nuclear magnetic resonance spectroscopy in clinical biochemistry and analytical toxicology. Nicholson and Wilson, 183.

**Clinical chemistry:** Applications of chemiluminescence to clinical, forensic and pharmaceutical analysis. Andrews, 38.
Developments in membrane-covered gas sensors for oxygen and other gases in relation to the clinical and biomedical field. Hahn, 336.
Ion-selective electrodes in clinical chemistry: state of the art. Lewenstam, 106.

**Cobalt:** Speciation of cobalt and nickel in the North Sea. Zhang and Wollast, 80.

**Complex formation:** Ternary complex formation between Alixarin Fluorine Blue, lanthanoid ions and ethylenediaminetetraacetic acid type chelating ligands. Bingham, Boyle, Ferris and Leonard, 197.

**Computer-based training:** Computer-assisted learning of analytical chemistry. Boother, 189.

**Copper:** Applications of a slotted tube atom trap and flame atomic absorption spectrometry: determination of antimony in copper-based alloys after hydride generation. Harriott, Thorburn Burns and Chimpalee, 193.
Determination of selenium in copper metal using flow

injection hydride generation atomic absorption spectrometry with continuous flow matrix isolation. Offley, Seare, Tyson and Kibble, 18.
Reduction of copper(II) in the presence of monoamines at the ionic strength of sea-water. Santos and Simões Gonçalves, 77.
**Coprecipitation:** Comparison of coprecipitation and chelating ion exchange for the preconcentration of selected heavy metals from sea-water. (Analytical Viewpoint.) Quigley and Vernon, 175.
**Corticosteroids:** Preliminary investigations into the use of supercritical fluid extraction to extract a novel corticosteroid (tipredane INN) from rodent diet. Euerby, Lewis and Nichols, 287.
**Coumarin (1,2-benzopyrone):** Total luminescence spectroscopy in the identification and detection of coumarin (1,2-benzopyrone) in road fuels. (Analytical Viewpoint.) Shanahan, Boley and Traynor, 210.
**Crystals, piezoelectric:** Examination of ammonia–polypyrrole interactions by piezoelectric and conductivity measurements. Slater and Watt, 344.

D

**Data, experimental:** Some artificial intelligence techniques for the interpretation of experimental data. Barker, 110.
**Detection, light scattering:** Analysis of fatty acid methyl esters by using supercritical fluid chromatography with mass evaporative light scattering detection. Cocks and Smith, 11.
**Detector, multiple array diode:** Approach to the computer aided interpretation of spectra produced on a diode array system. Brett, Kalsi, Cummins and Thombs, 224.
**Dinoflagellates:** Strategies in the design of an effective fibre optic sensor for the detection of paralytic shellfish poisons. (Analytical Viewpoint.) Guevremont, Quigley and Schweitzer, 241.
**Dioxacalixarenes:** Potassium-selective electrode based on a dioxacalixarene: an example of a new series of ionophores. Cadogan, Diamond, Cremin, McKervey and Harris, 13.
**Drug metabolism:** High-resolution nuclear magnetic resonance spectroscopy of biofluids and applications in drug metabolism. Everett, 181.

E

**Ecotoxicology:** Electroanalysis of metal speciation and its relevance to ecotoxicology. Morrison and Chen, 70.
**Education:** Analytical short courses for industrial needs. Smith, 190.
Computer-assisted learning of analytical chemistry. Boother, 189.
Continuing postgraduate education in analytical chemistry. Phillips, 281.
Continuing professional development for analytical chemists. Chadwick, 191.
Education and Training Committee—aims and activities. Williams, 391.
The aims of teaching analytical science in higher education. Fifield, 189.
Third report from sponsored VSO teacher. Archer, 310.
**Effluents, industrial:** Analytical difficulties in the full characterization of industrial effluents. Johnston and Stringer, 249.
**Electroanalytical chemistry:** Applications of amperometric biosensors. Turner, 376.
Applications of electropolymerized films in electrochemical sensors. Bartlett, 373.
Carbon-based electrodes and their application as electrochemical sensors for selected biomolecules. Hart and Wring, 4.
Chemically and biologically tailored interfaces as amperometric sensors. Wang, 102.
Conducting polymer-based amperometric chemical sensors. Lyons, Lyons, McCormack, McCabe, Breen and Cassidy, 104.
Control of ion transport through lipid membranes. Krull, Nikolelis, Brennan, Brown, Thompson, Ghaemmaghami and Kallury, 370.
Design and synthesis of receptors for sensor use. Lockhart, 369.
Determination of chromium speciation in sea-water. Boussemart and van den Berg, 68.
Disposable single-use sensors. Green and Hilditch, 374.
Electroanalysis of metal speciation and its relevance to ecotoxicology. Morrison and Chen, 70.
Electrochemical modelling of ion channel transport: thallium voltammetry at phospholipid monolayer coated mercury electrodes modified with gramicidin. Nelson, 64.
Gas sensors using the work function of organic semiconductors. Janata and Langmaier, 372.
*In situ* voltammetric measurements in natural waters: the advantages of microelectrodes. De Vitre, Tercier and Buffle, 74.
Investigation of organometallics in the marine ecosystem by high-performance liquid chromatography with inductively coupled plasma atomic emission spectrometric and electrochemical detection. Mazzucotelli, Viarengo, Canesi, De Paz, Ponzano and Rivaro, 79.
Ion-selective electrodes in clinical chemistry: state of the art. Lewenstam, 106.
Lead speciation in the Antarctic Ocean. Capodaglio, Scarponi and Cescon, 76.
Non-faradaic electrochemical sensors: principles and practice. Kell and Woodward, 378.
Novel solid-state potentiometric sensors. Kleitz, 369.
Performance of metal–ligand titration techniques. Ravenscroft and Gardner, 61.
Problems with the estimation of the complexation characteristics of dissolved organonickel complexes. Gerringa, 73.
Reality of metal speciation measurements in natural waters. van den Berg, 58.
Recent advances in applied electrochemical gas sensors. Cade, Gibbs, Iredale and Williams, 379.
Reduction of copper(II) in the presence of monoamines at the ionic strength of sea-water. Santos and Simões Gonçalves, 77.
Semiconductor gas sensors and selectivity. Coles, 367.
Solid-state gas sensors: prospects for selectivity. Williams, 366.
Speciation of cobalt and nickel in the North Sea. Zhang and Wollast, 80.
Speciation of iron in an Antarctic lake water by adsorptive cathodic stripping voltammetry. Abollino, Mentasti, Sarzanini, Porta and van den Berg, 72.
Stripping voltammetry of metal complexes with macromolecular ligands: some fundamental aspects. van Leeuwen, 66.
Time-resolved lanthanide(III) electroluminescence and its analytical feasibility. Haapakka, Kankare and Kulmala, 360.
Voltammetric determination of inorganic sulphur species in natural waters. Davison, 59.
Voltammetric investigation of natural waters using microelectrodes. Ansell, McAleer, McNaughtan and Pugh, 63.
**Electrochemical sensors:** *See* **Sensors, electrochemical.**
**Electrode, carbon based:** *See* **Carbon-based electrode.**
**Electrode, ion selective:** *See* **Ion-selective electrode.**

**Electrode, mercury drop:** Determination of trace amounts of bacitracin by differential-pulse adsorptive stripping voltammetry at a hanging mercury drop electrode. Moreira, Miller and Fogg, 16.
**Electrode, polymer modified:** Conducting polymer-based amperometric chemical sensors. Lyons, Lyons, McCormack, McCabe, Breen and Cassidy, 104.
**Electrophoresis, capillary:** Laser fluorimetric detection in capillary electrophoresis. Sepaniak, 359.
**Electrophoresis, gel:** Recent developments in gel electrophoresis of proteins. Dunn, 123.
**Environmental analysis:** Analytical difficulties in the full characterization of industrial effluents. Johnston and Stringer, 249.
Analytical requirements in view of North Sea environmental policy. Cofino, 260.
Co-ordination of North Sea research and the North Sea Database. Reid and Roberts, 258.
Detection of actinides in environmental samples by inductively coupled plasma mass spectrometry. Scott, Baxter, Hursthouse, McKay, Sampson and Toole, 382.
Determination and speciation of heavy metals in sea-water: an overview of methods available and results achievable. del Castilho, 253.
Environmental monitoring and analysis in the North Sea under the North Sea Task Force. Law and Thain, 250.
Interpretation of inorganic nutrient distributions in the North Sea. Hydes and Edmunds, 254.
Problems associated with the analysis of hydrocarbons in marine sediments. Large, 263.
Purge and trap of volatile organics in the marine environment using gas chromatography–mass spectrometry. Varney and Bianchi, 256.
Sampling considerations in the North Sea. Bale, 264.
Some recent trends in instrumental analysis of environmental materials. (Analytical Viewpoint.) Braun and Zsindely, 283.
**Enzymes:** Dye affinity chromatography. Scawen, 143.
Immunoaffinity purification of industrially relevant enzymes. Berry, 141.
**EPR:** *See* **Spectrometry, electron paramagnetic resonance.**
**Equipment news:** 21, 47, 85, 127, 156, 202, 232, 266, 297, 345, 385, 423.
**Erratum:** 422.
**Ethanol:** Use of platinum-based fuel cells for ethanol analysis. Criddle and Jones, 338.
**Experimental data:** *See* **Data, experimental.**
**Extraction, supercritical fluid:** Preliminary investigations into the use of supercritical fluid extraction to extract a novel corticosteroid (tipredane INN) from rodent diet. Euerby, Lewis and Nichols, 287.

## F

**Fatty acids:** *See* **Acids, fatty.**
**Federation of European Chemical Societies:** WPAC supported course on molecular sensor technology, 428.
Working Party on Analytical Chemistry (WPAC/FECS). (European Analytical Column 14), 1.
Working Party on Analytical Chemistry (WPAC/FECS). (European Analytical Column 15). Niinsto and Kellner, 100.
**Flow injection analysis:** Determination of selenium in copper metal using flow injection hydride generation atomic absorption spectrometry with continuous flow matrix isolation. Offley, Seare, Tyson and Kibble, 18.
Flow injection–from fireflies to field monitors. Worsfold, 214.
**Fluorescence spectroscopy:** *See* **Spectroscopy, fluorescence.**
**Fluorimetry:** Factors affecting the fluorimetric determination of polystyrene sulfonate in aqueous solution. (Analytical Viewpoint.) Harrop and Quigley, 398.
Laser fluorimetric detection in capillary electrophoresis. Sepaniak, 359.
**Foodstuffs:** Evaluation of the Foss–Heraeus Macro N for the determination of nitrogen in a wide range of foodstuffs, ingredients and biological materials and comparison with the Kjelfoss. (Analytical Viewpoint.) Smith, 320.
**Forensic analysis:** Applications of chemiluminescence to clinical, forensic and pharmaceutical analysis. Andrews, 38.
Strategies for the use of the polymerase chain reaction in forensic analysis. Sullivan, Tully, Hopgood, Lingard and Gill, 153.
**Foss–Heraeus Macro N:** Evaluation of the Foss–Heraeus Macro N for the determination of nitrogen in a wide range of foodstuffs, ingredients and biological materials and comparison with the Kjelfoss. (Analytical Viewpoint.) Smith, 320.
**Fourier transform infrared spectrometry:** *See* **Spectrometry, infrared.**
**FTIR:** *See* **Spectrometry, infrared.**
**Fuel, road:** Total luminescence spectroscopy in the identification and detection of coumarin (1,2-benzopyrone) in road fuels. (Analytical Viewpoint.) Shanahan, Boley and Traynor, 210.

## G

**Gas analysis:** Gas analysis using mass spectrometry. Nicholas, 343.
Gas monitoring based on phthalocyanines and related materials. Honeybourne and O'Donnell, 333.
Gas analysis: Fuel cell sensor design for carbon monoxide and methanol using platinum single crystals. Attard, 331.
Use of ion mobility spectroscopy for the detection and analysis of vapours. Watts, 328.
**Gas chromatography:** *See* **Chromatography, gas.**
**Gas sensors:** *See* **Sensors, gas.**
**Gel electrophoresis:** *See* **Electrophoresis, gel.**
**Government Chemist:** Appointment of new Government Chemist, 137.
**Gramicidin:** Electrochemical modelling of ion channel transport: thallium voltammetry at phospholipid monolayer coated mercury electrodes modified with gramicidin. Nelson, 64.
**Graphite furnace atomiser:** *See* **Atomiser, graphite furnace.**

## H

**Headspace vapours:** Evaluation of sensors coated on piezoelectric quartz crystals for the determination of aromatic compounds. Elmosalamy, Harris, Moody and Thomas, 326.
Fuel cell sensor design for carbon monoxide and methanol using platinum single crystals. Attard, 331.
Headspace analysis by gas chromatography–mass spectrometry of polymers and polymer additives. Boden, 344.
**High-performance liquid chromatography:** *See* **Chromatography, HPLC.**
**HPLC:** *See* **Chromatography, HPLC.**
**Hydride generation:** Investigation of *in situ* concentration of hydride forming elements in a graphite furnace atomiser. Chaudry, Ure, Cooksey, Littlejohn and Halls, 44.
**Hydrocarbons:** Problems associated with the analysis of hydrocarbons in marine sediments. Large, 263.

I

**IFST President:** Election of T. Gorsuch, 204.
**Industrial effluents:** *See* **Effluents, industrial.**
**Industry:** Analytical short courses for industrial needs. Smith, 190.
Two applications of principal components analysis of an industrial process and quantitative analysis of water in a substrate. Scott, 245.
**Infrared spectra:** Cluster analysis with infrared spectra. Adams, 147.
**Infrared spectrometry:** *See* **Spectrometry, infrared.**
**Instrumentation:** Current aspects of laser instrumentation. McCoustra, 409.
Evaluation of analytical instrumentation. Part VII. Simultaneous wavelength dispersive X-ray spectrometers. Report by the Analytical Methods Committee, 312.
**Intelligence techniques:** Some artificial intelligence techniques for the interpretation of experimental data. Barker, 110.
**Interface, thermospray:** Thermospray interface for high-performance liquid chromatography–diffuse reflectance Fourier transform infrared analysis. Robertson, Wylie, Littlejohn, Watling and Dowle, 8.
**Interpretation, of spectra:** Approach to the computer aided interpretation of spectra produced on a diode array system. Brett, Kalsi, Cummins and Thombs, 224.
**Ion exchange:** Comparison of coprecipitation and chelating ion exchange for the preconcentration of selected heavy metals from sea-water. (Analytical Viewpoint.) Quigley and Vernon, 175.
**Ion mobility spectroscopy:** *See* **Spectroscopy, ion mobility.**
**Ion transport:** Control of ion transport through lipid membranes. Krull, Nikolelis, Brennan, Brown, Thompson, Ghaemmaghami and Kallury, 370.
**Ion-selective electrode:** Ion-selective electrodes in clinical chemistry: state of the art. Lewenstam, 106.
Potassium-selective electrode based on a dioxacalixarene: an example of a new series of ionophores. Cadogan, Diamond, Cremin, McKervey and Harris, 13.
Sodium-selective poly(vinyl chloride) membrane ion selective electrode based on a novel calix[4]arene ionophore. Cunningham, Svehla, Harris and McKervey, 294.
**Iron:** Speciation of iron in an Antarctic lake water by adsorptive cathodic stripping voltammetry. Abollino, Mentasti, Sarzanini, Porta and van den Berg, 72.

K

**Kerosine:** Spectrophotometric end-point for the phase-titration determination of the adulteration of petrol with kerosine. Bahari, Criddle and Thomas, 14.
**Kjelfoss:** Evaluation of the Foss–Heraeus Macro N for the determination of nitrogen in a wide range of foodstuffs, ingredients and biological materials and comparison with the Kjelfoss. (Analytical Viewpoint.) Smith, 320.

L

**Lanthanides:** Time-resolved lanthanide(III) electroluminescence and its analytical feasibility. Haapakka, Kankare and Kulmala, 360.
**Lanthanoid ions:** Ternary complex formation between Alizarin Fluorine Blue, lanthanoid ions and ethylenediaminetetraacetic acid type chelating ligands. Bingham, Boyle, Ferris and Leonard, 197.
**Laser excitation spectroscopy:** *See* **Spectroscopy, laser excitation.**
**Lead:** Lead speciation in the Antarctic Ocean. Capodaglio, Scarponi and Cescon, 76.
**Ligands:** Ternary complex formation between Alizarin Fluorine Blue, lanthanoid ions and ethylenediaminetetraacetic acid type chelating ligands. Bingham, Boyle, Ferris and Leonard, 197.
**Light scattering:** *See* **Detection, light scattering.**
**Lipid membranes:** *See* **Membranes, lipid.**
**Lipids:** Analysis of fatty acid methyl esters by using supercritical fluid chromatography with mass evaporative light scattering detection. Cocks and Smith, 11.
**Luminescence:** Bioluminescent sensors. Coulet and Blum, 358.
From fluorescent probes to optical sensors. Wolfbeis, 357.
Laser fluorimetric detection in capillary electrophoresis. Sepaniak, 359.
Robert Boyle (1627–1691): a foundation stone of analytical chemistry in the British Isles. Part VI. Contributions to the early study of luminescence. Thorburn Burns, 362.
Time-resolved lanthanide(III) electroluminescence and its analytical feasibility. Haapakka, Kankare and Kulmala, 360.
**Lunar Society:** The Lunar Society and Midlands chemists. Thorburn Burns, 402.

M

**Magnesium:** Magnesium as modifier for the determination of barium by flame atomic emission spectrometry. Jerrow, Marr and Cresser, 40.
**Marine sediments:** *See* **Sediments, marine.**
**Mass spectrometry:** *See* **Spectrometry, mass.**
**Matrix isolation:** Determination of selenium in copper metal using flow injection hydride generation atomic absorption spectrometry with continuous flow matrix isolation. Offley, Seare, Tyson and Kibble, 18.
**Membranes, lipid:** Control of ion transport through lipid membranes. Krull, Nikolelis, Brennan, Brown, Thompson, Ghaemmaghami and Kallury, 370.
**Mercury drop electrode:** *See* **Electrode, mercury drop.**
**Mercury:** Field sampling technique for mercury speciation. Jian and McLeod, 293.
**Metal complexes:** Stripping voltammetry of metal complexes with macromolecular ligands: some fundamental aspects. van Leeuwen, 66.
**Metal speciation:** Determination and speciation of heavy metals in sea-water: an overview of methods available and results achievable. del Castilho, 253.
Electroanalysis of metal speciation and its relevance to ecotoxicology. Morrison and Chen, 70.
Field sampling technique for mercury speciation. Jian and McLeod, 293.
Reality of metal speciation measurements in natural waters. van den Berg, 58.
**Methanol:** Fuel cell sensor design for carbon monoxide and methanol using platinum single crystals. Attard, 331.
**Modelling, molecular:** Applications of cluster analysis in molecular modelling and drug design. Livingstone, 247.
**Molecules, large:** Laser electronic spectroscopy of large molecules. Hollas, 411.
**Monitors, field:** Flow injection—from fireflies to field monitors. Worsfold, 214.

N

**Nickel:** Speciation of cobalt and nickel in the North Sea. Zhang and Wollast, 80.
**Nitrate ions:** Determination of nitrite and nitrate ions by electron paramagnetic resonance spectrometry. Tsang, Thorburn Burns and Flockhart, 10.
Determination of nitrite and nitrate ions by electron

paramagnetic resonance spectrometry. Tsang, Thorburn Burns and Flockhart, 10.

**Nitrogen:** Evaluation of the Foss–Heraeus Macro N for the determination of nitrogen in a wide range of foodstuffs, ingredients and biological materials and comparison with the Kjelfoss. (Analytical Viewpoint.) Smith, 320.

**Nomenclature:** Nomenclature for chromatography (IUPAC), 390.

**North Sea:** *See* **Water.**

**North Sea Research Database:** Co-ordination of North Sea research and the North Sea Database. Reid and Roberts, 258.

**North Sea Task Force:** Co-ordination of North Sea research and the North Sea Database. Reid and Roberts, 258.

Environmental monitoring and analysis in the North Sea under the North Sea Task Force. Law and Thain, 250.

**Nuclear magnetic resonance (NMR) spectroscopy:** High-resolution nuclear magnetic resonance spectroscopy of biofluids and applications in drug metabolism. Everett, 181.

Strategic applications of proton nuclear magnetic resonance spectroscopy in clinical biochemistry and analytical toxicology. Nicholson and Wilson, 183.

Use of high-field nuclear magnetic resonance spectroscopy for the analysis of biological fluids. Wilson, Nicholson, Ghauri and Blackledge, 217.

**Nutrients:** Interpretation of inorganic nutrient distributions in the North Sea. Hydes and Edmunds, 254.

O

**Obituary:** 26, 57, 132, 303, 429.

**Odour, detection:** Odour detection using sensor arrays. Persaud, 339.

Warwick electronic nose. Bartlett, Dodd, Gardner and Shurmer, 343.

**Optimization:** Chemometrics as an aid to liquid chromatography optimization. Brereton, 145.

**Organic acids:** *See* **Acids, organic.**

**Organisms, toxic:** Strategies in the design of an effective fibre optic sensor for the detection of paralytic shellfish poisons. (Analytical Viewpoint.) Guevremont, Quigley and Schweitzer, 241.

**Organonickel complexes:** Problems with the estimation of the complexation characteristics of dissolved organonickel complexes. Gerringa, 73.

**Oxygen:** Developments in membrane-covered gas sensors for oxygen and other gases in relation to the clinical and biomedical field. Hahn, 336.

P

**Petrol:** Spectrophotometric end-point for the phase-titration determination of the adulteration of petrol with kerosine. Bahari, Criddle and Thomas, 14.

**Pharmaceutical analysis:** Applications of chemiluminescence to clinical, forensic and pharmaceutical analysis. Andrews, 38.

Chromatographic analysis of novel pharmaceutical excipients for liquid filled capsules. Hawley, Rowley, Lough and Chatham, 289.

Enantiospecific bioanalysis. Hutt, 185.

Implications of regulatory requirements for bioanalytical techniques and resources. Vose, 177.

Liquid–liquid and liquid–solid phase extraction as applied to the determination of drugs in biological samples. Whelpton, 178.

Pharmaceutical analysis—past present and future. Phillips, 420.

Preliminary investigations into the use of supercritical fluid extraction to extract a novel corticosteroid (tipredane INN) from rodent diet. Euerby, Lewis and Nichols, 287.

Supercritical fluid chromatography of polar compounds. Morgan, Huang and Wilson, 186.

Use of mass spectrometry in pharmaceutical analysis. Ashcroft, 179.

**Phase extraction:** Liquid–liquid and liquid–solid phase extraction as applied to the determination of drugs in biological samples. Whelpton, 178.

**Phthalocyanines:** Gas monitoring based on phthalocyanines and related materials. Honeybourne and O'Donnell, 333.

**Platinum:** Use of platinum-based fuel cells for ethanol analysis. Criddle and Jones, 338.

**Platinum, single crystals:** Fuel cell sensor design for carbon monoxide and methanol using platinum single crystals. Attard, 331.

**Polymerase chain reaction:** Molecular archaeology. Hagelberg, 152.

Strategies for the use of the polymerase chain reaction in forensic analysis. Sullivan, Tully, Hopgood, Lingard and Gill, 153.

Strategies of the polymerase chain reaction. Malcolm, 154.

**Polymer, films:** Applications of electropolymerized films in electrochemical sensors. Bartlett, 373.

**Polymer modified electrodes:** *See* **Electrodes, polymer modified.**

**Polymers:** Headspace analysis by gas chromatography–mass spectrometry of polymers and polymer additives. Boden, 344.

**Polypyrrole:** Examination of ammonia–polypyrrole interactions by piezoelectric and conductivity measurements. Slater and Watt, 344.

**Polystyrene sulfonate:** Factors affecting the fluorimetric determination of polystyrene sulfonate in aqueous solution. (Analytical Viewpoint.) Harrop and Quigley, 398.

**Potassium:** Potassium-selective electrode based on a dioxacalixarene: an example of a new series of ionophores. Cadogan, Diamond, Cremin, McKervey and Harris, 13.

**Principal component analysis:** Cluster analysis with infrared spectra. Adams, 147.

Principal component analysis: an introduction. Smith, 150.

Two applications of principal components analysis of an industrial process and quantitative analysis of water in a substrate. Scott, 245.

**Proteins:** Dye affinity chromatography. Scawen, 143.

Recent developments in gel electrophoresis of proteins. Dunn, 123.

**Publication received:** 28, 92, 164, 207, 276, 306, 394.

Q

**Quartz crystals, piezoelectric:** Evaluation of sensors coated on piezoelectric quartz crystals for the determination of aromatic compounds. Elmosalamy, Harris, Moody and Thomas, 326.

R

**Receptors, biological:** Design and synthesis of receptors for sensor use. Lockhart, 369.

**Royal Society of Chemistry:** Analytical Chemistry Trust Fund accounts for year ended December 31st, 1990, 309.

**Royal Society of Chemistry Awards 1989:** Electroanalytical chemistry—A. G. Fogg, 309.

**Royal Society of Chemistry Awards 1990:** Analytical separation methods—R. M. Smith, 281.

Chemical analysis and instrumentation—L. D. Hall, 281.

Spectroscopy—I. M. Mills, 281.

S

**Sampling:** Field sampling technique for mercury speciation. Jian and McLeod, 293.
Sampling considerations in the North Sea. Bale, 264.
**Sealants, anaerobic:** Investigation of a cation exchange separation method for the determination of transition metal ions in anaerobic sealants. O'Dea, Deacon, Smyth and Leonard, 82.
**Sea-water:** *See* **Water.**
**Seaweed:** Determination of total tin in acid digests of seaweed and sediments using hydride generation and quartz-tube electrothermal atomization. Harriott, Thorburn Burns and Donaghy, 194.
**Sediments, marine:** Determination of total tin in acid digests of seaweed and sediments using hydride generation and quartz-tube electrothermal atomization. Harriott, Thorburn Burns and Donaghy, 194.
Problems associated with the analysis of hydrocarbons in marine sediments. Large, 263.
**Selenium:** Determination of selenium in copper metal using flow injection hydride generation atomic absorption spectrometry with continuous flow matrix isolation. Offley, Seare, Tyson and Kibble, 18.
**Semiconductors:** Gas sensors using the work function of organic semiconductors. Janata and Langmaier, 372.
Semiconductor gas sensors and selectivity. Coles, 367.
**Sensor array:** Chemometrics—the key to sensor array development. Haswell and Walmsley, 115.
Multivariate calibration of potentiometric sensor arrays. Forster and Diamond, 117.
**Sensors, acoustic wave:** Competitive adsorption on to coated surface acoustic wave sensors. Alder, 325.
**Sensors, biomedical:** Applications of amperometric biosensors. Turner, 376.
Disposable single-use sensors. Green and Hilditch, 374.
**Sensors, electrochemical:** *See also* **Sensors, gas.**
Applications of electropolymerized films in electrochemical sensors. Bartlett, 373.
Carbon-based electrodes and their application as electrochemical sensors for selected biomolecules. Hart and Wring, 4.
Chemically and biologically tailored interfaces as amperometric sensors. Wang, 102.
Conducting polymer-based amperometric chemical sensors. Lyons, Lyons, McCormack, McCabe, Breen and Cassidy, 104.
Non-faradaic electrochemical sensors: principles and practice. Kell and Woodward, 378.
Novel solid-state potentiometric sensors. Kleitz, 369.
**Sensors, fibre optic:** Strategies in the design of an effective fibre optic sensor for the detection of paralytic shellfish poisons. (Analytical Viewpoint.) Guevremont, Quigley and Schweitzer, 241.
**Sensors, fuel cell:** Use of platinum-based fuel cells for ethanol analysis. Criddle and Jones, 338.
**Sensors, gas:** Developments in membrane-covered gas sensors for oxygen and other gases in relation to the clinical and biomedical field. Hahn, 336.
Evaluation of sensors coated on piezoelectric quartz crystals for the determination of aromatic compounds. Elmosalamy, Harris, Moody and Thomas, 326.
Examination of ammonia–polypyrrole interactions by piezoelectric and conductivity measurements. Slater and Watt, 344.
Fuel cell sensor design for carbon monoxide and methanol using platinum single crystals. Attard, 331.
Gas monitoring based on phthalocyanines and related materials. Honeybourne and O'Donnell, 333.
Gas sensors using the work function of organic semiconductors. Janata and Langmaier, 372.
Odour detection using sensor arrays. Persaud, 339.
Recent advances in applied electrochemical gas sensors. Cade, Gibbs, Iredale and Williams, 379.
Semiconductor gas sensors and selectivity. Coles, 367.
Solid-state gas sensors: prospects for selectivity. Williams, 366.
Vapour sensing by the technique of surface plasmon resonance. Jaggers, Shaw and Peacock, 341.
Warwick electronic nose. Bartlett, Dodd, Gardner and Shurmer, 343.
**Sensors, optical:** Bioluminescent sensors. Coulet and Blum, 358.
From fluorescent probes to optical sensors. Wolfbeis, 357.
Laser fluorimetric detection in capillary electrophoresis. Sepaniak, 359.
**Shellfish:** Strategies in the design of an effective fibre optic sensor for the detection of paralytic shellfish poisons. (Analytical Viewpoint.) Guevremont, Quigley and Schweitzer, 241.
**Slotted tube atom trap:** *See* **Atom trap.**
**Sodium:** Sodium-selective poly(vinyl chloride) membrane ion selective electrode based on a novel calix[4]arene ionophore. Cunningham, Svehla, Harris and McKervey, 294.
**Sodium chloride:** *See* **Brine.**
**Solid-state sensors:** *See* **Sensors, gas.**
**Speciation, of metals:** *See* **Metal speciation.**
**Spectrometry, atomic absorption:** Applications of a slotted tube atom trap and flame atomic absorption spectrometry: determination of antimony in copper-based alloys after hydride generation. Harriott, Thorburn Burns and Chimpalee, 193.
Determination of selenium in copper metal using flow injection hydride generation atomic absorption spectrometry with continuous flow matrix isolation. Offley, Seare, Tyson and Kibble, 18.
Determination of total tin in acid digests of seaweed and sediments using hydride generation and quartz-tube electrothermal atomization. Harriott, Thorburn Burns and Donaghy, 194.
Investigation of *in situ* concentration of hydride forming elements in a graphite furnace atomiser. Chaudhry, Ure, Cooksey, Littlejohn and Halls, 44.
**Spectrometry, atomic emission:** Investigation of organometallics in the marine ecosystem by high-performance liquid chromatography with inductively coupled plasma atomic emission spectrometric and electrochemical detection. Mazzucotelli, Viarengo, Canesi, De Paz, Ponzano and Rivaro, 79.
Magnesium as modifier for the determination of barium by flame atomic emission spectrometry. Jerrow, Marr and Cresser, 40.
**Spectrometry, electron paramagnetic resonance:** Determination of nitrite and nitrate ions by electron paramagnetic resonance spectrometry. Tsang, Thorburn Burns and Flockhart, 10.
**Spectrometry, infrared:** Thermospray interface for high-performance liquid chromatography–diffuse reflectance Fourier transform infrared analysis. Robertson, Wylie, Littlejohn, Watling and Dowle, 8.
**Spectrometry, mass:** Detection of actinides in environmental samples by inductively coupled plasma mass spectrometry. Scott, Baxter, Hursthouse, McKay, Sampson and Toole, 382.
Gas analysis using mass spectrometry. Nicholas, 343.
Headspace analysis by gas chromatography–mass spectrometry of polymers and polymer additives. Boden, 344.
Laser mass spectroscopy. Ledingham, 413.
Purge and trap of volatile organics in the marine environment using gas chromatography–mass spectrometry. Varney and Bianchi, 256.
Use of mass spectrometry in pharmaceutical analysis. Ashcroft, 179.

**Spectrometry, X-ray fluorescence:** Evaluation of analytical instrumentation. Part VII. Simultaneous wavelength dispersive X-ray spectrometers. Report by the Analytical Methods Committee, 312.
**Spectrophotometry:** Spectrophotometric end-point for the phase-titration determination of the adulteration of petrol with kerosine. Bahari, Criddle and Thomas, 14.
**Spectroscopy, fluorescence:** From fluorescent probes to optical sensors. Wolfbeis, 357.
Laser-induced fluorescence. Pfab, 415.
**Spectroscopy, ion mobility:** Use of ion mobility spectroscopy for the detection and analysis of vapours. Watts, 328.
Spectroscopy, laser excitation: Current aspects of laser instrumentation. McCoustra, 409.
Introduction to laser excitation spectroscopy. Andrews, 408.
Laser electronic spectroscopy of large molecules. Hollas, 411.
Laser-induced fluorescence. Pfab, 415.
Laser mass spectroscopy. Ledingham, 413.
Multiphoton absorption spectroscopy. Ashfold, 416.
Picosecond photodissociation and geminate radical recombination of tetraphenylhydrazine. Hyde and Beddard, 418.
**Spectroscopy, luminescence:** Total luminescence spectroscopy in the identification and detection of coumarin (1,2-benzopyrone) in road fuels. (Analytical Viewpoint.) Shanahan, Boley and Traynor, 210.
**Stripping voltammetry:** *See* **Voltammetry.**
**Sulphur:** Voltammetric determination of inorganic sulphur species in natural waters. Davison, 59.
**Supercritical fluid chromatography:** *See* **Chromatography, supercritical fluid.**
**Supercritical fluid extraction:** *See* **Extraction, supercritical fluid.**
**Surface acoustic wave sensors:** *See* **Sensors, acoustic wave.**
**Surface plasmon resonance:** Vapour sensing by the technique of surface plasmon resonance. Jaggers, Shaw and Peacock, 341.
**Surface-active agents:** *See* **Agents, surface active.**

T

**Tetraphenylhydrazine:** Picosecond photodissociation and geminate radical recombination of tetraphenylhydrazine. Hyde and Beddard, 418.
**Thermospray interface:** *See* **Interface, thermospray.**
**Tin:** Determination of total tin in acid digests of seaweed and sediments using hydride generation and quartz-tube electrothermal atomization. Harriott, Thorburn Burns and Donaghy, 194.
**Tipredane INN:** Preliminary investigations into the use of supercritical fluid extraction to extract a novel corticosteroid (tipredane INN) from rodent diet. Euerby, Lewis and Nichols, 287.
**Total luminescence spectroscopy:** *See* **Spectroscopy, luminescence.**
**Toxicology, analytical:** *See* **Analytical toxicology.**
**Trace metals:** Comparison of coprecipitation and chelating ion exchange for the preconcentration of selected heavy metals from sea-water. (Analytical Viewpoint.) Quigley and Vernon, 175.
Development of an automated high-performance liquid chromatography system for the determination of trace metals in concentrated brines. Handley, Jones, Ebdon and Barnett, 37.
High-performance liquid chromatographic determination of some trace metal ions using a novel column switching technique. Ryan and Meaney, 41.
**Transition metal ions:** Investigation of a cation exchange separation method for the determination of transition metal ions in anaerobic sealants. O'Dea, Deacon, Smyth and Leonard, 82.

U

**Urine:** *See* **Biological fluids.**

V

**VAM Programme:** Validity of analytical measurements. King and Phillips, 125.
**Voltammetry:** Determination of chromium speciation in sea-water. Boussemart and van den Berg, 68.
Determination of trace amounts of bacitracin by differential-pulse adsorptive stripping voltammetry at a hanging mercury drop electrode. Moreira, Miller and Fogg, 16.
Electrochemical modelling of ion channel transport: thallium voltammetry at phospholipid monolayer coated mercury electrodes modified with gramicidin. Nelson, 64.
*In situ* voltammetric measurements in natural waters: the advantages of microelectrodes. De Vitre, Tercier and Buffle, 74.
Speciation of iron in an Antarctic lake water by adsorptive cathodic stripping voltammetry. Abollino, Mentasti, Sarzanini, Porta and van den Berg, 72.
Stripping voltammetry of metal complexes with macromolecular ligands: some fundamental aspects. van Leeuwen, 66.
Voltammetric determination of inorganic sulphur species in natural waters. Davison, 59.
Voltammetric investigation of natural waters using microelectrodes. Ansell, McAleer, McNaughtan and Pugh, 63.

W

**Water:** Analytical difficulties in the full characterization of industrial effluents. Johnston and Stringer, 249.
Analytical requirements in view of North Sea environmental policy. Cofino, 260.
Comparison of coprecipitation and chelating ion exchange for the preconcentration of selected heavy metals from sea-water. (Analytical Viewpoint.) Quigley and Vernon, 175.
Co-ordination of North Sea research and the North Sea Database. Reid and Roberts, 258.
Determination and speciation of heavy metals in sea-water: an overview of methods available and results achievable. del Castilho, 253.
Determination of chromium speciation in sea-water. Boussemart and van den Berg, 68.
Electroanalysis of metal speciation and its relevance to ecotoxicology. Morrison and Chen, 70.
Electrochemical modelling of ion channel transport: thallium voltammetry at phospholipid monolayer coated mercury electrodes modified with gramicidin. Nelson, 64.
Environmental monitoring and analysis in the North Sea under the North Sea Task Force. Law and Thain, 250.
*In situ* voltammetric measurements in natural waters: the advantages of microelectrodes. De Vitre, Tercier and Buffle, 74.
Interpretation of inorganic nutrient distributions in the North Sea. Hydes and Edmunds, 254.
Investigation of organometallics in the marine ecosystem by high-performance liquid chromatography with inductively coupled plasma atomic emission spectrometric and electrochemical detection. Mazzucotelli, Viarengo, Canesi, De Paz, Ponzano and Rivaro, 79.

Lead speciation in the Antarctic Ocean. Capodaglio, Scarponi and Cescon, 76.
Performance of metal–ligand titration techniques. Ravenscroft and Gardner, 61.
Problems associated with the analysis of hydrocarbons in marine sediments. Large, 263.
Problems with the estimation of the complexation characteristics of dissolved organonickel complexes. Gerringa, 73.
Purge and trap of volatile organics in the marine environment using gas chromatography–mass spectrometry. Varney and Bianchi, 256.
Reality of metal speciation measurements in natural waters. van den Berg, 58.
Reduction of copper(II) in the presence of monoamines at the ionic strength of sea-water. Santos and Simões Gonçalves, 77.
Sampling considerations in the North Sea. Bale, 264.
Speciation of cobalt and nickel in the North Sea. Zhang and Wollast, 80.
Speciation of iron in an Antarctic lake water by adsorptive cathodic stripping voltammetry. Abollino, Mentasti, Sarzanini, Porta and van den Berg, 72.
Two applications of principal components analysis of an industrial process and quantitative analysis of water in a substrate. Scott, 245.
Voltammetric determination of inorganic sulphur species in natural waters. Davison, 59.
Voltammetric investigation of natural waters using microelectrodes. Ansell, McAleer, McNaughtan and Pugh, 63.
**Working Party on Analytical Chemistry (WPAC):** *See* **Federation of European Chemical Societies.**

## X

**X-Ray fluorescence spectrometry:** *See* **Spectrometry, X-ray fluorescence.**

Typeset and printed by Black Bear Press Limited, Cambridge, England